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What is scientific evidence?</th></tr>
<tr><td colspan="2">Literacy Strategy: Making Connections Practice</td><td colspan="2">Science Concept: Scientists rely on evidence to support claims and to explain things. Scientific evidence comes from investigations in the form of information, data.</td></tr>
<tr><td>Reading TEKS:
(1)(b)(6)(E)</td><td>CCSS:
RI.1.3</td><td>NGSS:
1-LS2-2, 1-LS3-1</td><td>Science TEKS:
1(2)(D)(E)</td></tr>
<tr><td colspan="4">Materials for Mini-lessons on Science-specific Disciplinary Literacies (referred to as Mini-lesson):
chart paper, markers, text to model strategy</td></tr>
<tr><td colspan="4">Materials for Science Inquiry Circles: Class and Team inquiry charts, pencils, informational texts and videos</td></tr>
<tr><td colspan="4">Materials for Science Investigation: See lesson</td></tr>
<tr><td colspan="4">Content Vocabulary:
Claim –a statement that says something is true based on observations or an opinion
Evidence–data that supports a claim or answer
Data-details, information, or facts that come from research and investigations
Reasoning-thinking about and explaining how the evidence supports acclaim</td></tr>
<tr><td colspan="4">Science and Literacy Connection: Scientists and strategic readers make connections between what is already known and new information that is collected through observations, investigations, and reading.</td></tr>
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Reading Mini lesson — 15 minutes

OVERVIEW

Mini lesson practice should be used as a time to practice the reading strategies previously taught in this unit. Teachers are encouraged to use this time to best meet the needs of their students. Perhaps your class needs more time with the mini-lesson from the day before, or you may choose to circle back to mini lessons from a week ago. The choice is yours; we just ask that you use this time to practice!

Teachers should determine if this mini lesson will be facilitated with the whole group or a small group (i.e., a particular inquiry circle group) who needs additional support. If you are working with a small group, we suggest your other learners spend additional time within the inquiry circles.

This Mini-Lesson gives children the opportunity to practice some of the reading strategies you have taught them.

EXPLAIN THE STRATEGY

Each statement below contains suggested wording for the lesson in quotations and teacher actions in parenthesis:

PROCEDURE

Declarative Knowledge (Tell them what the strategy is that they are learning)

1. Say something like, "Today we will continue to practice making connections. It is thinking about the text and how it relates to myself, another text, or the world. I can also think about science and how it relates to myself, other sciences, and the world." Refer to the anchor chart previously made with the class.

Conditional Knowledge (Tell them when and why you know to use the strategy)

2. Say something like, "Yesterday, we talked about how I know to use this strategy (making connections) because the text or science investigation reminds me of something I already know. This strategy is important because my brain stores information in neat compartments (like drawers, or buckets). As I observe the world around me, my brain is always trying to 'match' the new information with what I know. Some people call this schema. Making connections helps me organize my new information in my brain so I can find/locate it later."

Procedural Knowledge (Tell them the steps to using the strategy)

3. For this section in the mini-lesson, the teacher may choose to model the strategy again for the class. Be sure to use a different text or page in the text than what you modeled yesterday.
4. Teachers are encouraged to share examples of students using this strategy from the day before. Say something like, "Mohamed's group did a great job yesterday making connections. I was so impressed when they____." Teachers are also encouraged to invite the groups to share with their peers (you may need to scaffold this and prepare the students for sharing beforehand.)

If you choose to model this strategy again, you might want to say something like:

5. The first thing I do is access my schema about the topic. I can think about what aspects of the old information can help me understand the new information.
6. I can ask myself literacy questions like 'How does this text relate to something I've already done before?' 'How does this text relate to something I have read before?' or 'How does this text relate to something that I've seen in a movie/song or that someone has told me about before?'
7. I can also ask myself science questions like 'Have I observed anything like this effect in my life?' 'Have I seen similar effects in other experiments?' or 'How might this effect interact with others in the real world?'
8. Now, I will use those connections that I've made to help me understand what I'm seeing (in science) or reading (in a text). Once I've made the connection, my schema may have been changed or reaffirmed.

Practice in text (print, video, or interview)

Remind the young scientists that they have copies of the all the anchor charts in their mini-lesson journals and encourage them to use the strategies in their work

Science Inquiry Circles — 30 minutes

OVERVIEW

Scientists work in teams when conducting research and investigations. Each day of this unit, students will work in inquiry circle groups while embodying the role of a scientist. They will do so by taking on roles of scientists in research by speaking like a scientist, reading like a scientist, and writing like a scientist.

PROCEDURE

Before Inquiry Circle Groups — 5 minutes

You might want to say something like this to the readers:

1. It is time to get into our inquiry circle groups. You will be with the same research team as yesterday.
2. When we research ecosystems, we will practice our roles as scientists. We will do this because scientists have a special way in which they observe the world, read scientific texts, and write reports. There is no better way to learn about science than to become a scientist!

During Inquiry Circle Groups — 20 minutes

You might want to say something like this to the readers:

3. We have anchor charts to help guide your thinking. Do not forget to use them while in groups. (Refer to the "Language of a Scientist" anchor chart and the daily anchor chart. Remind students that they can use all the reading strategies taught, not just the one for that day.)
4. My role is to help guide the inquiry circle groups, but I expect you to work as a scientific team to solve your problems together.
5. Do not forget to answer your research questions and record it on the inquiry chart. It is important to record your sources on the inquiry chart as you complete it. (Be sure to explicitly explain how students should use the chart.)

(While groups are working together, walk around the room to facilitate as needed.)

After Inquiry Circle Groups — 5 minutes

You might want to say something like this to the readers:

6. As we are concluding our inquiry circle groups for today, each group will have a chance to share what they accomplished and learned.
7. The Lab Director should lead the discussion with their inquiry circle group about today's results. For example, what did you learn about your animals and their dependence on other organisms in their environment? Which reading strategies did you use? What problems did you encounter? How did you resolve those problems?
8. The Data Scientist will now share with the entire class either something the group learned about their animals and their dependence on other organisms in their environment, which reading strategy(ies) were used, or how the group solved a problem.

Science Investigation — 30 minutes

OVERVIEW
Students learn how to develop claims then use evidence from their investigations to support them.

GUIDING QUESTION
What is a claim? What is evidence? What information or data can I use as evidence from my investigation?

BACKGROUND INFORMATION
Scientific evidence is data used to support answers to questions or claims generated by investigations. Evidence can come from your own investigations, the investigations of others, and from reasoning. Using a Claims, Evidence, and Reasoning (CER) approach teaches students how to organize information logically like scientists do.

It also helps them understand how to support an explanation by using relevant data. At this early age, they learn to "back-up" what they say with tangible evidence, in this case, what they "see". Moreover, making the connections between their claims and evidence begins to develop reasoning skills applicable to any other core discipline.

SAFETY
There are no safety issues.

MATERIALS
- Science journals
- Chart paper
- Copy of "Practice CER Chart" student page

SET UP
Before the class:

- On a sheet of chart paper, write:
  Our prediction was **"We think pill bugs will eat_____."**

  (Claim) **We can now say that pill bugs (do or do not eat)** _____.

  (Evidence)**We know because**_____.

  (Reasoning**) We think** _____

- Post or set up sheet of chart paper where it can be seen by the class.
- Teacher will make copies of the "Practice CER Chart", 1 per student.

DAILY OBSERVATIONS
Pill bug observations have ended.

PROCEDURE
Engage

1. Ask students, “What do we now know about pill bugs?” Accept responses. Listen for connections to the other organisms (decomposers) they have been researching. Use the class inquiry chart to prompt them if needed.
2. Remind the class, “Last week you set up investigations to see what food pill bugs liked best to eat. And every day you observed them to see what they were doing and what was happening to their food”.
3. “You made predictions about what food pill bugs would eat. Now it’s time to see if your predictions were correct!”.

Explore

4. Ask the Equipment Directors to hand out the Practice CER student pages and the science journals.
5. Explain, “After scientists finish an investigation, they make a “**claim**” or say what they think is true from their work”. “However, they cannot simply say “it’s true”, they have to **‘back it up’** with information, or **evidence**, from their investigation”.
6. “Today, we will practice together how to make a “claim” about an investigation and ‘back it up’ with information. We will use this CER chart to organize our information. (Point to the chart) The ‘C’ stands for claim”.
7. “I will pretend I just did an investigation and I have data, or evidence, that I can use”. (Point to the ‘E”) “E stands for evidence”.
8. Explain this practice will help them make their own *real* claims charts later. Instruct them to copy what you write on the chart on their handouts.
9. On the chart, point to and read aloud the prediction stem sentence **“We think pill bugs will eat…”**. Remind them that this is just an example so you will write in a food. (Note: Select a food that no team has picked.)
   Ex: “We think pill bugs will eat <u>green beans.”</u>
10. Explain, “Your prediction may or may not have been correct, either one is ok. The important thing is what you can **now** say. Scientists call this making a claim”.
11. Point to and read the next stem sentence. **“We can now say that pill bugs _____(**write in **<u>do not like green beans).”</u>** Explain this is their claim, or what they think is true.
12. Ask, “But **how** do you know that the pill bugs didn’t like the green beans?”
    Point to the prompt **“How do we know?** Ask for their ideas on how to answer this; what would be a clue that they didn’t like the green beans? Accept responses.
    If needed, give an example of how they can answer this: **“All the green beans are still there”.** Explain that this is the **evidence** they have which will back up their claim.
13. Next, point to the prompt **“We think…” (**Point to the ‘R’) Explain the “R” stands for reasoning, and here they will write **what the evidence is telling them.** Ask, “If all the green beans are still there, doesn’t that tell us they didn’t like them or didn’t want to eat them?”
14. So, we can write something like **“We think they didn’t eat the green beans because** ____ (write in a student response or **they like other food instead!**”
    Note: It is hoped that students will communicate on their own that pill bugs are decomposers and prefer the decaying or dead matter!

Explain

15. “Now that we have practiced how to use a CER chart, each team will present the results of their own investigation using this same design.”
16. “In the next class you will use this example to complete your own CER chart, using information you have collected in your journals. Are there any questions about the CER chart we just completed?”
17. Assure the class that you will spend time in the next class working with them on this.

Elaborate

18. To conclude, tell the class that tomorrow you will discuss how they will make a science presentation about their research and investigation!
19. Let them know that it will be a fun activity!

Evaluate

20. Did students communicate a reasonable understanding of how to make a claim?
21. Did they communicate an understanding of how to "back up" their claim with evidence?
22. Are students using science language in their communications (verbal or written)?

Expanded Standards

Reading TEKS: (1)(b)(6)(E) Comprehension skills: listening, speaking, reading, writing, and thinking using multiple texts. The student uses metacognitive skills to both develop and deepen comprehension of increasingly complex texts. The student is expected to (E) make connections to personal experiences, ideas in other texts, and society with adult assistance.
CCSS: (RI.1.3) Describe the connection between two individuals, events, ideas, or pieces of information in a text.
NGSS: (1-LS2-2) Science uses drawings, sketches, and models as a way to communicate ideas. 1-LS3-1 Science & Engineering Practices-Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
Science TEKS: 1(2)(D) record and organize data using pictures, numbers, and words; and (E) communicate observations and provide reasons for explanations using student-generated data from simple descriptive investigations.